



3,4-Methylenedioxypropylvalerone (MDPV)

(Street Names: "bath salts," "Ivory Wave," "plant fertilizer," "Vanilla Sky," "Energy-1")

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DEA/OD/ODE

Introduction

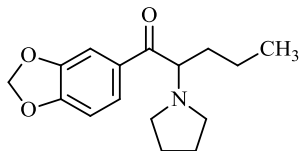
3,4-Methylenedioxypropylvalerone (MDPV) is a designer drug of the phenethylamine class. MDPV is structurally related to cathinone, an active alkaloid found in the khat plant, 3,4-methylenedioxymethamphetamine (MDMA), methamphetamine, and other schedule I phenethylamines. MDPV, like some other substances in this class, is a central nervous system (CNS) stimulant. MDPV is also reported to have hallucinogenic effects. Law enforcement evidence indicates that the abuse of MDPV in the United States is increasing. MDPV has been identified in products that are falsely marketed as "bath salts," "plant food," and "research chemicals" and is sold over the Internet and at local retail shops.

Licit Uses

MDPV is not approved for medical use in the United States.

Chemistry

MDPV (1-(1,3-Benzodioxol-5-yl)-2-(1-pyrrolidinyl)-1-pentanone; Chemical Abstract Service Number 687603-66-3) is related in chemical structure to schedule I hallucinogenic substances (MDMA, MDEA) and to schedule I stimulants (cathinone, methcathinone). Its molecular formula is $C_{16}H_{21}NO_3$ and its molecular weight is 275 g/mol. MDPV has a high melting point (estimated at 200°C) and is a solid at room temperature. The chemical structure is shown below.



Pharmacology

It has been demonstrated that MDPV administered to mice increased the extracellular levels of dopamine levels 60 min after administration of MDPV. Though MDPV increased dopamine levels, the effect was not as marked as the increases induced by methamphetamine or MDMA.

Because of the limited number of studies involving MDPV, the pharmacology of MDPV was also predicted using structure activity relationship (SAR) data available for other phenethylamines. Based on SAR analyses, the pharmacology of MDPV would be expected to be similar to that of MDMA, as well as other substances of the phenethylamine chemical class.

MDPV has been reported to induce subjective effects in humans similar to those induced by cocaine, amphetamine, and MDMA. The subjective effects induced by substituted cathinones are feelings of empathy, stimulation, alertness, euphoria, and awareness of senses.

Other effects reported from the use of MDPV were tachycardia, hypertension, vasoconstriction, and sweating. MDPV has also been reported to cause intense, prolonged panic attacks in users. Repeat users have reported bouts of psychosis and a craving or a strong desire or urge to use again.

Users of MDPV anecdotally reported that they take 25 mg or less per session. The duration of the subjective effects is about two to three hours whereas the adverse effects have been reported lasting six to eight hours after administration.

User Population

User population information in the United States is very limited. There have been reports of MDPV being used predominantly by the youth population. MDPV data are not reported by any national drug study programs.

Illicit Distribution

MDPV has been identified in a seized product called "Ivory Wave". It has been sold as a "bath salt" in 500 mg packets with the label indicating "for novelty use only" or "not for human consumption" without any instructions for dosage. MDPV has also been identified in the products called "Vanilla Sky" and "Energy 1."

DEA's National Forensic Laboratory Information System (NFLIS) indicates that federal, state and local law enforcement officials encountered MDPV in 34 states and the District of Columbia since 2009. The number of MDPV exhibits increased from two in 2009 to 338 in 2010. From January through September 2011, there are 911 MDPV exhibits reported so far in the NFLIS database.

Control Status

As of October 21, 2011, MDPV, its salts, isomers, and salts of isomers have been temporarily controlled in schedule I of the Controlled Substances Act.

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section, Fax 202-353-1263, Telephone 202-307-7183, or E-mail ODE@usdoj.gov.